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Signed

R. Mahoney

Dated 18 February 2004



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GB0301697.9

By virtue of a direction given under Section 30 of the Patents Act 1977, the application is proceeding in the names of

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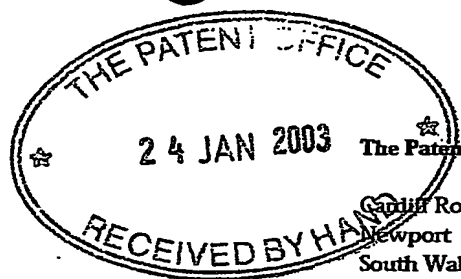
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Request for grant of a patent

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MNH/21259

2. Patent application number

(The Patent Office will fill in this part)

0301697.9

27JAN03 E779872-3 000180
P01/7700 0.00-0301697.9

3. Full name, address and postcode of the or of each applicant (underline all surnames)

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Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

0855 437 ACT APPLICATION FILED 17/1/03
SECTION 42 6001

P.S.O.

4. Title of the invention

Horse Shoe

5. Name of your agent (if you have one)

A A THORNTON & CO

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

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Patents ADP number (if you know it)

0000075001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number
(if you know it)

Date of filing
(day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing
(day / month / year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if

NO

a) any applicant named in part 3 is not an inventor, or
b) there is an inventor who is not named as an applicant, or

c) any named applicant is a corporate body.

See note (d))

Patents Form 1/77

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Continuation sheets of this form 1

Description 9

Claim(s)

Abstract

Drawing(s) 3 + 2 *M2*

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

Request for preliminary examination and search (Patents Form 9/77)

Request for substantive examination (Patents Form 10/77)

Any other documents (please specify)

11.

I/We request the grant of a patent on the basis of this application.

Signature

M. A. Hedges & Co

Date

23.01.03

12. Name and daytime telephone number of person to contact in the United Kingdom

MARTIN NICHOLAS HEDGES - 01604 638242

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Horse Shoe

The present invention relates to horse shoes and in particular to removable horse shoes which are retained on the hoof of an animal by means other than nailing.

It is well known that exercising horses on hard surfaces causes excessive wear to the animal's hooves, and it is therefore common practice to attached shoes to horses' hooves to reduce damage resulting from such exercising animals on roads etc. Even in circumstances where the animals are not being exercised on hard surfaces and hence wear to the hooves should not be a problem, for example horse racing on grass surfaces, it is still common practice to shoe animals in order to improve the animals grip and hence avoid possible injury from the animal slipping during a race. Indeed, special race shoes have been developed which are of a lighter weight to prevent handicapping of a particular animal, and also, in some cases, which include studs or the like to further improve grip in particularly damp conditions.

The form of such horse shoes for use when an animal is exercising has changed little over the centuries and typically comprise a metal band which is forged into a generally 'U' shape and fastened to the animals hoof by nailing. Whilst these shoes are, as stated above, primarily applied to protect the animal's hooves, the nails which are used to hold them in place themselves cause a significant amount of damage – indeed it has been suggested that a majority of lameness in horses is a result of the nails which are driven into their feet in horse to attach the horse shoes. Such damage is exasperated in racing animals on which the aforementioned lightweight racing shoes are used during races. These racing shoes are typically made of materials such as aluminium which, although light, are soft and therefore wear very quickly. Typically, then, the racing shoe is applied at most a day before a race and removed as soon as possible after the race is completed and replaced with a better wearing but heavier type of shoe. Such constant changing of the shoe requires nails repeatedly to be removed from and reinserted into the animals hoof, causing further damage to the wall of the horse's foot each time. Indeed, it is not

unusual, over a period of time, for the hoof to become so damaged that whole sections of the wall of the hoof simply fall out, requiring the hoof artificially to be reconstructed using epoxy resin or the like so that a shoe can again be attached.

A further problem with conventional horse shoes is that, unless fitted properly, they can reduce the blood flow through the animal's leg. On the underside of the hoof of a horse is a projection commonly called the frog. When a horse puts its foot to the ground, pressure is applied to the frog which assists in pumping blood back up the leg of the animal. However, due to the U shaped formation of a horse shoe, the frog is elevated from the ground on a shoed hoof, reducing the pressure applied thereto as a horse walks, and hence reducing the pumping action thereof.

Horse shoes are also known which take the form of a boot that encloses the whole hoof rather than just being attached to the underside thereof, such shoes typically being attached to the hoof by means of a strap which passes around the ankle of the animal just above the bulb. These shoes are, however, used exclusively for therapeutic reasons and are designed to be a very loose fit on the hoof – their loose fit and single strap retention system means that they are quickly thrown from the animal's foot during exercise.

According to the present invention there is provided a horse shoe comprising a sole member, a front panel which is connected to and extends upward from the front of said sole so as, in use, to enclose the front of the hoof of an animal, a back panel which is connected to and extends upwards from the back of said sole so, in use, to extend around the back of the hoof of an animal, resiliently deformable side panels which extend between said front and back panels on either side of the shoe, a front strap assembly which extends obliquely on both sides of the shoe between a rear portion of the base and said front panel, and a rear strap assembly which extends obliquely on both sides of the shoes between a front portion of the base and said back panel.

A horse shoe in accordance with the invention has the advantage that the strap configuration is secure enough to ensure that the shoe does not move on nor is thrown from the animal's hoof during even the most strenuous exercise such as during a horse race whilst, at the same time, avoid the need to any intrusive fastening means such as nails or the like, thereby avoiding damaging the animal's hoof during attachment or removal. The arrangement of the front strap assembly ensures that the front of the shoe is held back and down onto the foot, whilst, at the same time, the rear strap assembly lifts and holds the heel of the shoe up to the foot, thereby ensuring a good and reliable fit of the shoe on the animal in all conditions and foot positions.

Furthermore, the construction facilitates quick fitting and removal, maximising the time during which the animal's foot can be left in its natural, un-shod, state, which is most conducive to an animal with healthy hooves. The resiliently deformable side panels enable the front and back panels of the shoe to be stretched apart during fitting, thereby facilitating the placement of the shoe on the hoof of the animal whilst still maintaining a tight fit once the shoe is in place. Furthermore, by connecting the front and back panels separately to the sole of the shoe and not connecting them directly to each other, the back panel is able to pass inside the front panel as the sole bends during use, thereby enabling the shoe uniquely to adjust to every angle adopted by the foot of the animal during exercise. Suitable materials for the side panels might be elastic, neoprene, rubber or the like.

Preferably, the inner side of the base member, which forms an innersole of the shoe, is made from a memory retaining material which moulds to the shape of the underside of the foot or hoof. It has been found that EVA foam is particularly good for this purpose. In this way, a particularly comfortable fit of the shoe on the particular animal is achieved. The innersole also preferably has two frog supports formed thereon which support each side of the frog. This has the advantage of assisting grip given to the base of the foot or hoof, and also assists in ensuring that the frog operates to provide proper circulation in the legs of the animal. Preferably, the frog supports are lanceolate leaf shaped and are

positioned symmetrically on either side of the centre line of the shoe with their major axes inclined towards each other towards the front of the shoe. This results in a particularly effective engagement with the tapering sides of the forwardly pointing 'V' shaped frog of the horse's hoof.

The front and rear strap assemblies are preferably each composed of a pair of straps, one end of each said strap being permanently attached to the respective portion of the sole of the shoe and the other end being fastenable to the respective front or back panel by means of anchoring means provided on said panels proximate to the upper edge thereof. More particularly, each of the front and back panels includes a pair of buckles, positioned symmetrically on each side of the shoe to which the straps attach. In the preferred embodiment, the front buckles are attached to opposite ends of a front anchor strap which is attached to the front panel proximate to the ankle opening of the shoe and which extends transversely across the centreline of the shoe, and the back buckles are attached to opposite ends of a back anchor strap which is fastened to the back panel proximate to the ankle opening of the shoe and which extends around the back of the shoe transversely of the centre line. The fastening of the straps to the buckles may be achieved in a number of well known ways, but it has been found to be particularly effective if each strap is provided on its outer surface with a first hook and loop fastening material along a first portion of its length extending from its free end and a second hook and loop fastening material, complementary to said first material, along a second portion of its length extending from said first portion towards said sole. Each strap is then fastened by threading it through its associated buckle and folding it back onto itself, interaction of the two materials securing the strap to itself.

The provision of buckles is not however, essential to the invention. Instead, fastening may be achieved, for example, by providing hook and loop material on the inner surface of the straps and on the outer surface of the front and back panels in a well known manner.

Instead of attached in to the front and back panels, the straps may instead attached directly to each other across the front and back panels respectively so as to provide the necessary clamping force. In this embodiment, however, it is advantageous to provide guide means on the front and back panels to ensure that the straps lie on said panels in positions to optimise their effectiveness in retaining the shoe on the hoof of the animal.

The sole is preferably composed of a plurality of layer which are sandwiched together, and, in an advantageous development, has a suitable tread pattern applied to its lower surface. Straps to form the front and rear strap assemblies are then advantageously integrally formed with one of the layers of the sole, preferably an intermediate inner sole layer. This has the advantage of ensuring a particularly secure and reliable connection between the sole of the shoe and the straps.

Advantageously, the inner surface of the front panel or horn cover has a gripping property, which may be achieved by suitable finishing of the material of the panel or by applying a separate material to the surface thereof. This has the advantage that the horn of the hoof is gripped by the front panel, thereby preventing any twisting or forward movement of the hoof within the shoe.

The inner surface of the back panel is also preferably shaped to complement the shape of the back of the hoof of a typically animal so as to ensure a comfortable and tight fit on the hoof, and may also be provided with a gripping surface to further improve the grip of the back panel on the heel of the hoof.

The shoe may be formed from a number of materials. However, it has been found to be preferable for the bottom of the sole and the back panel to be formed of rubber, the front and back of the sole which folds up to form the toe and heel cap similarly being formed of rubber, and for the front panel and inner sole to be formed from EVA foam.

The shoe of the invention may also be used for medical purposes. In particular, the inner sole may be replaced by a gauze pad to treat a foot injury, this having the advantage that it can easily be applied by a lone person whereas the present practice of utilising a bag and bandages to retain a gauze on the hoof is time consuming to apply and normally requires two people. Such medical treatments are normally applied for a relatively short period of no more than 48 hours, and the animal will not be exercised during that period. Accordingly, a shoe for this purpose may be made of less robust material and it has been found to be particularly advantageous when making such a shoe to use EVA foam for the front and back panels as well as the outer sole.

In order that the invention may be well understood, there will now be described an embodiment thereof, given by way of example, reference being made to the accompanying drawings, in which:

Figure 1 is a left side view of a horse shoe according to the invention;

Figure 2 is a front view of the horse shoe of Figure 1;

Figure 3 is a right side view of the horse shoe of Figure 1;

Figure 4 is a plan view of a part of the sole of the horse shoe of Figure 1 to which front and rear straps are attached; and

Figure 5 is a plan view of the horse shoe of Figure 1.

Referring first to Figure 1, there is shown a horse shoe 1 embodying the invention which has a sole 2 that is sized and shaped generally to match the general size and shape of the base of the hoof of an animal, which is inclined upwards at the front 3 and rear 4 to form a toe cap 3 and a heel cap 4, and on the bottom surface of which may be formed a suitable grip or tread pattern. A conventional metal shoe may also be attached to the bottom of the sole 2 to provide improved grip. Attached around the front edge of the sole 2 is a front panel 5 which forms a horn cover. The horn cover 5 is inclined to the sole 2 and extends upwards therefrom in a generally rearward direction. It is furthermore curved to complement the curvature of the front or horn of the hoof of the animal with

which it is to be used and the top edge 6 is shaped to provide a comfortable engagement with the front of the ankle of the animal. The inner surface of the horn cover 5 is furthermore finished so as to have a gripping property which holds onto the front surface of the hoof so as to help to prevent any twisting or forward movement of the hoof in the shoe.

Attached around the rear edge of the sole 2 is a back panel 8 which extends generally vertically from the sole 2 and forms a heel or bulb support. The horn cover 5 is again curved to complement the general shape of the rear or bulb of the foot. In particular, as shown in Figure 5, the inner surface of the bulb support 8 has a pair of depressions 10a, 10b formed therein which engage with the two protrusions on the back of the foot of the animal and hence ensure both a tight and a comfortable fit on the hoof. As with the horn cover 5, the top edge of the bulb support is also shaped to provide a comfortable but tight fit with the back of the ankle of the animal.

As can be seen from the drawings, the sides of the front and back panels 5, 8 are attached separately to the sole 2 of the shoe 1 – they are not directly joined to each other. Instead, as best shown in Figures 1 and 3, the front and back panels 5, 8 are separated on each side of the shoe by a web of elastic material 11, 12. These elastic side panels 11, 12 pull said front 5 and back 8 panels towards each other so that, in use, they tightly engage the horn and bulb respectively of the hoof whilst allowing the top opening 14 of the shoe 1 to be expanded by pulling the front and back panels 5, 8 part to stretch the side panels 11, 12 and hence facilitate fitting of the shoe onto the hoof of the animal. Furthermore, because the rigid front and back panels are not directly joined to each other, the rear panel 8 is able to pass on the inside of the front panel 5 as the heel of the sole is lifted from the ground, thereby enabling the shoe uniquely to adjust to every position adopted by the foot during movement on the front, length and width of the shoe.

In order to secure the hoof within the shoe, front and rear straps are provided which are attached to the sole 2. In the preferred embodiment, the sole 2 is formed of two or more

layers, one of which 20 has four straps integrally formed therewith as shown in Figure 4, two back straps 21a, 21b which extend from the back of the sole 2 and two front straps 22a, 22b which extend from the front of the sole 2. The back straps 21a, 21b are shaped so as to extend diagonally forwards and upwards along each side of the shoe and fasten to respective front buckles 23a, 23b mounted symmetrically on either side of the front panel 5 proximate to the top thereof. In the illustrated embodiment, the front buckles 23a, 23b are attached to either end of a front anchor strap 24 which extends transversely across the bridge of the front panel 5 and is attached thereto by suitable means such as stitching or gluing. However, the front buckles 23a, 23b may instead be attached to separate front anchor straps or, indeed, may be directly fastened to the front panel 5.

The front straps 22a, 22b are similarly shaped to extend diagonally upwards and rearwards along either side of the shoe 1, so that, in use, the front strap will cross the back strap on each side or vice versa, and associated rear fastening buckles 25a, 25b are provided symmetrically on each side of the back panel 8 proximate to the top thereof for fastening of the front straps 22a, 22b on each side of the shoe as shown in Figures 1 and 3. As with the front buckles, the rear buckles 25a, 25b are attached to either end of a rear anchor strap 26 in the illustrated embodiment, which extends transversely across the top of the back panel 8 and is attached thereto by suitable means such as stitching or gluing. The rear buckles 25a, 25b may again instead be attached to separate rear anchor straps or, indeed, may be directly fastened to the back panel 8.

The actual fastening between the straps 21a, 21b, 22a, 22b and their respective buckles 23a, 23b, 25a, 25b may be achieved in any well known fashion. It has, however, been found particularly to facilitate fitting and removal of the shoe if the straps are provided with hook and loop fastening material on their outer surface and, in use, are each looped through their respective buckle and then folded back so as to fasten onto themselves in a well known manner. Such an arrangement enables the shoe to be properly tightened very easily due to the leverage afforded to the fitter when a strap has been looped through its buckle.

In an embodiment of the invention not illustrated, the buckles are omitted altogether and the front and rear anchor straps are instead provided with hook and loop or similar fastening material on their outer surfaces, each of the front and rear straps being provided with complementary hook and loop material on their inner surfaces so that the straps are simply pressed against the anchor straps to fasten them thereto.

In order to ensure that the hoof is properly positioned in the shoe, a pair elongated protrusions 30a, 30b are provided on the innersole, positioned symmetrically on either side of the centre line of the sole 2. As shown in Figure 5, which, in use, support the frog of the hoof when properly fitted. In the illustrated embodiment, these frog supports 30a, 30b are lanceolate leaf shaped with their major axes inclined towards each other towards the front of the shoe so that they engage against the inclined sides of the frontward pointing, generally V shaped frog of a typical horses hoof. Other designs of Frog support are also possible within the scope of the invention.

The outer sole 2 is preferably formed of rubber as is the back panel 8, whereas the front panel 5 and the innersole are preferably formed of EVA foam. The shoe may also, however, be used for medical purposes in which case the innersole is replaced by a medical gauze and the front and rear panels and sole may all then be formed of EVA foam.

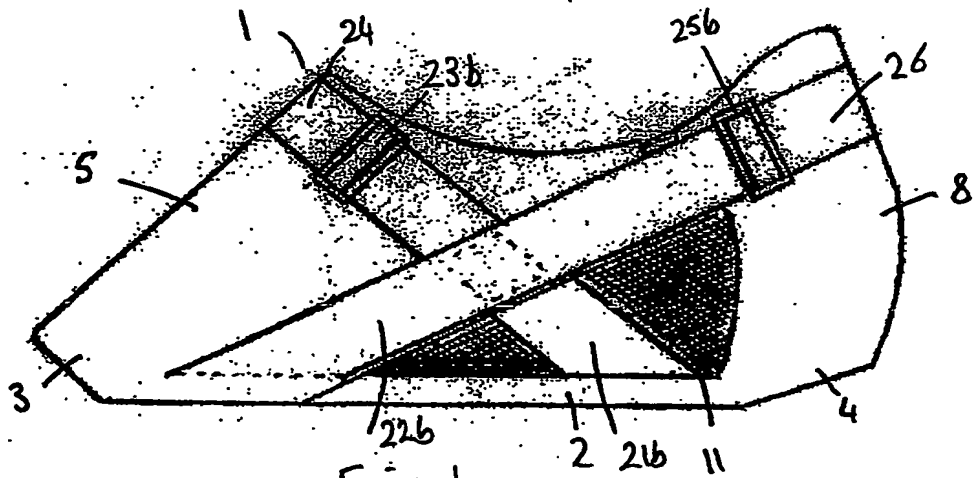


Figure 1

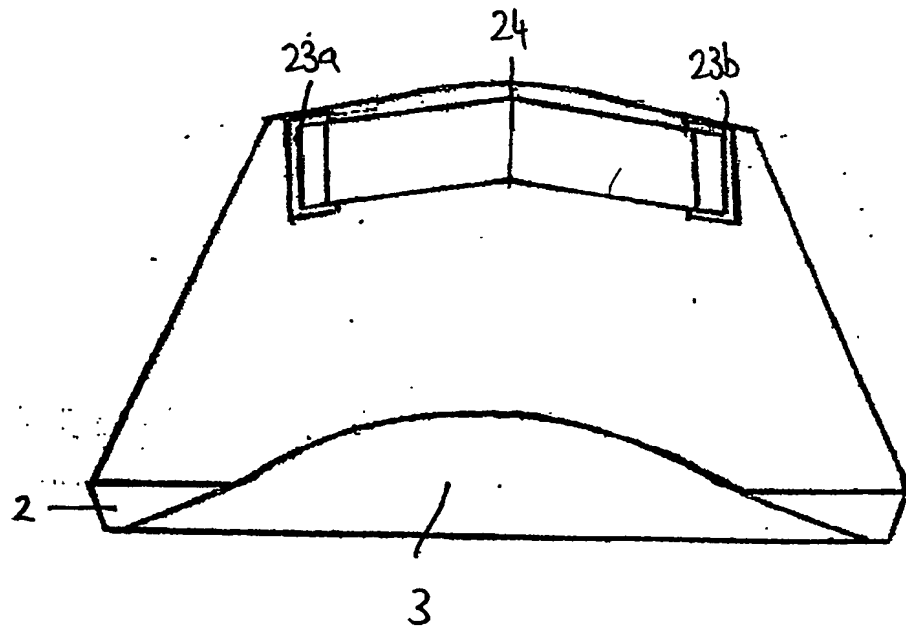
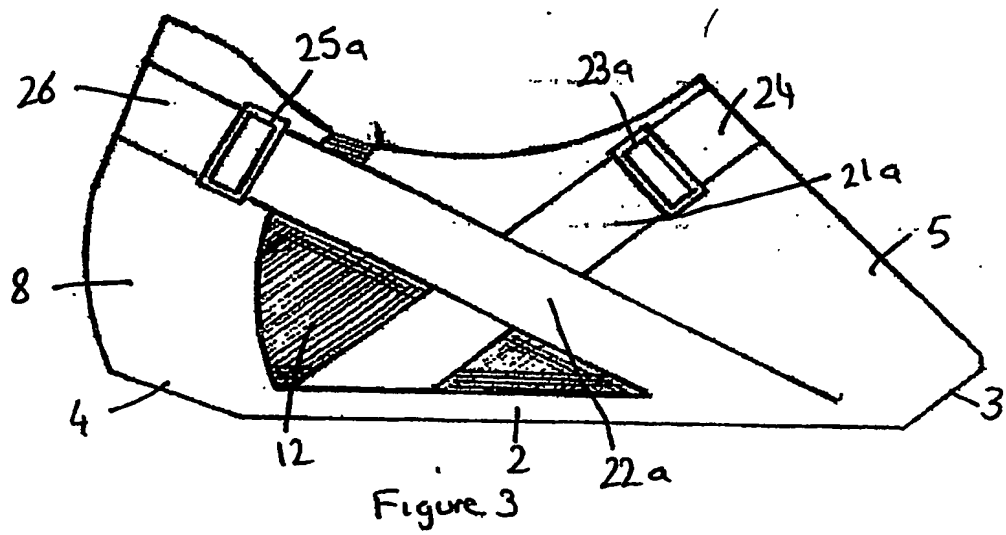
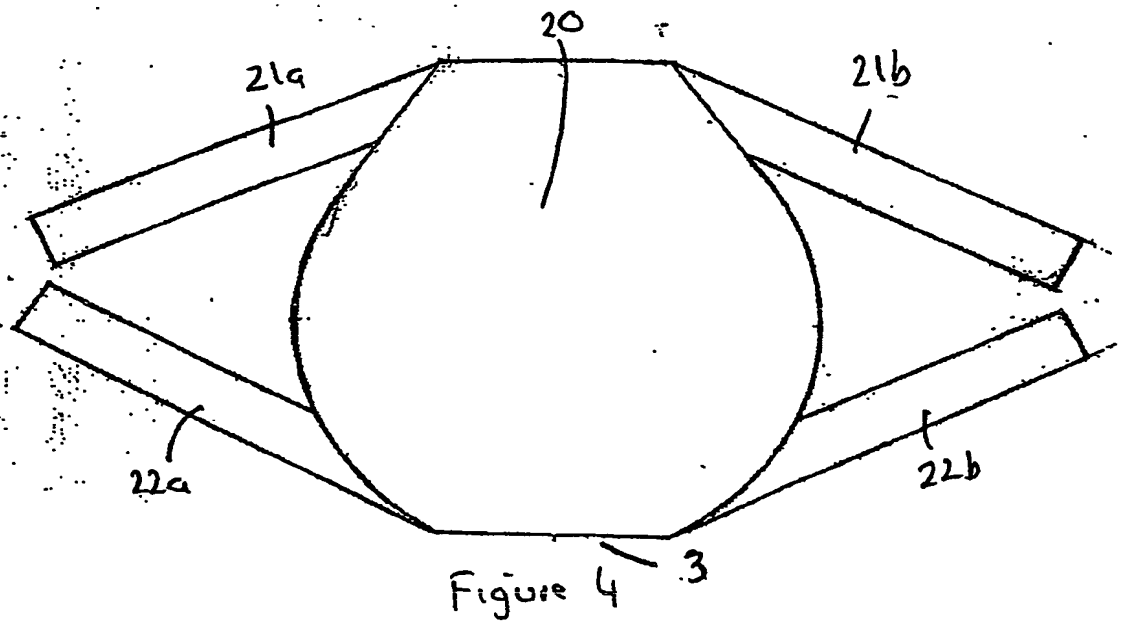
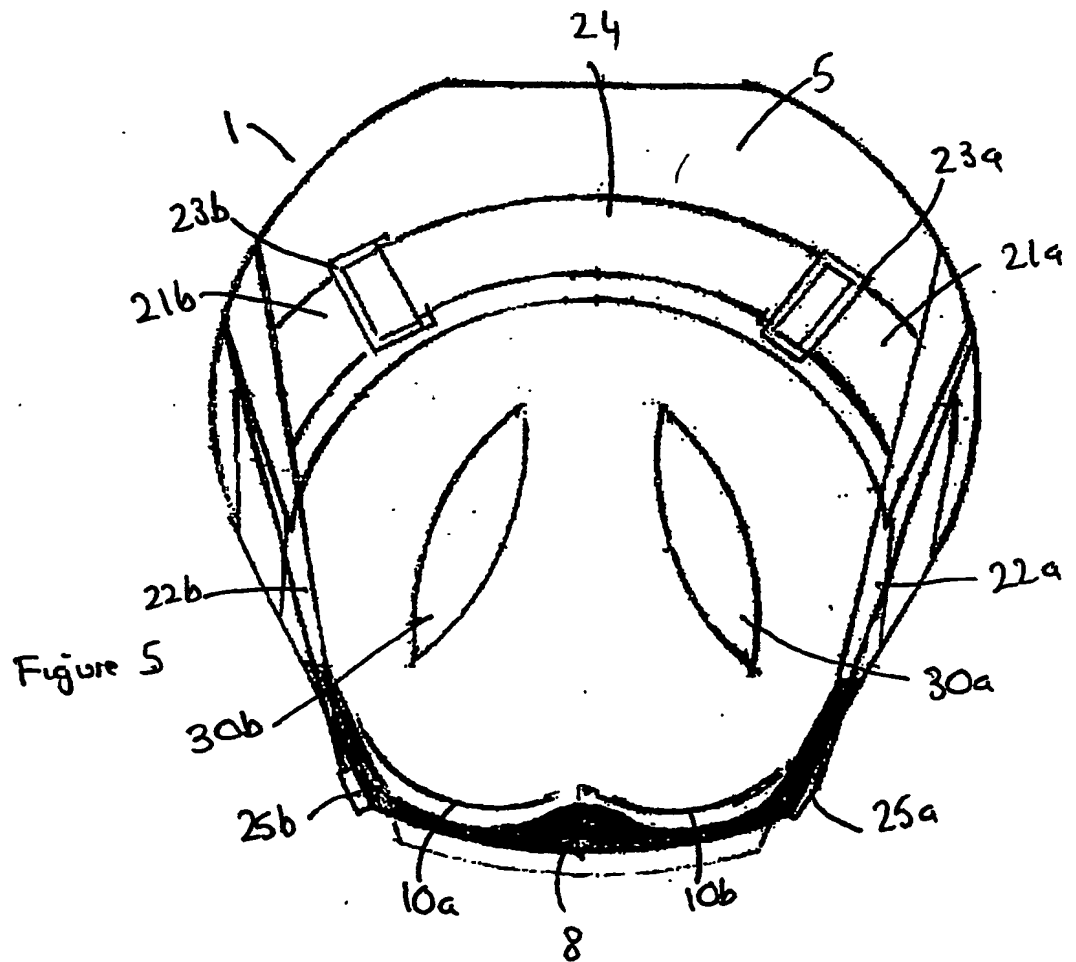


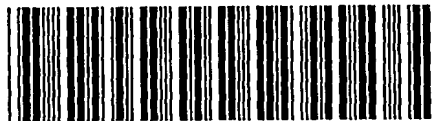
Figure 2

2/3





PCT Application
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